Cost of skin cancer in England

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Background

• Incidence of and mortality from skin cancer are increasing each year

• Malignant melanoma have increased by a larger amount than many other major cancers in recent years

• Increase awareness of health impact and growing interest in its financial costs

• Cost of illness study funded by SWPHO as part of the NAEDI initiative
Aims

- Investigate cost of skin cancer
  - NHS cost
  - Non-NHS cost
- Using to approaches
  - Top-down (update Morris et al., 2009)
  - Bottom-up
- Compare with Programme Budgeting Data
- Projections of skin cancer costs to 2020
Methods – NHS cost

• Top-down approach
  – Assign national all-cause expenditure data from administrative sources to skin cancer (Hospital Episode Statistics; Morbidity Statistics from General Practices; Cancer Statistics, ONS)
  – Unit cost taken from published national sources (PSSRU; NHS Reference Cost Data)
  – Separately for malignant melanoma and other malignant neoplasms of the skin
  – Estimates used to estimate true incidence of non-melanoma (SWPHO)
Methods – NHS cost

• Bottom-up
  – Cost of care incurred by individual patients receiving skin cancer treatment, aggregated up to national levels based on number of patients following each treatment pathway.

  – Identify care pathways (Literature Search; Clinical guidelines; Map of Medicine; Expert Opinion)

  – Populate pathway model (Literature Search; Administrative Database; Relevant Websites)

  – Multiplying the expected costs per case by the total number of cases (Cancer Statistics, ONS; SWPHO)
Methods – Non-NHS Costs

- Cost incurred by patients in the receipt of care
  - Travel and time cost (Literature Search)
- Morbidity costs
  - Lost working days due to skin cancer (Department of Work and Pension; Average Earning, ONS)
- Mortality costs
  - Lost working life years due to skin cancer (Mortality Statistics, ONS; Retirement Age, ONS; Employment, ONS)
Methods – Costs in 2020

• We project our 2008 cost estimates out to 2020 based on published estimates of the future incidence of melanoma (Diffey, 2004)

• We base our projections on the future incidence of melanoma only, given uncertainties surrounding the true incidence of non-melanoma skin cancer

• Our estimates of the incidence of non-melanoma skin cancer are assumed to be proportional to the cases of melanoma.
Results – NHS cost

- Top-down approach

<table>
<thead>
<tr>
<th></th>
<th>Malignant melanoma of skin</th>
<th>Other malignant neoplasms of skin</th>
<th>All skin cancers</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP consultations</td>
<td>£000 % NHS</td>
<td>£000 % NHS</td>
<td>£000 % NHS</td>
</tr>
<tr>
<td>Inpatient stays</td>
<td>1,077 4.9</td>
<td>4,435 4.9</td>
<td>5,511 4.9</td>
</tr>
<tr>
<td>Day cases</td>
<td>9,098 41.1</td>
<td>23,273 25.8</td>
<td>32,372 28.8</td>
</tr>
<tr>
<td>Outpatient attendances</td>
<td>2,465 11.1</td>
<td>22,849 25.3</td>
<td>25,314 22.5</td>
</tr>
<tr>
<td>Outpatient attendances</td>
<td>9,522 43.0</td>
<td>39,684 44.0</td>
<td>49,206 43.8</td>
</tr>
<tr>
<td>NHS costs</td>
<td>22,162 100</td>
<td>90,241 100</td>
<td>112,403 100</td>
</tr>
</tbody>
</table>
Results – NHS cost

- **Bottom-up approach**

  - Primary care examination
  - Referral to specialist
  - Referral to specialist
  - Treat in primary care
  - Successful
  - Benign
  - Self-monitoring
  - Follow-up
  - Diagnostic biopsy
  - Referral to specialist
  - Non-melanoma
  - Self-monitoring
  - Follow-up
  - Benign
  - Topical drug treatment
  - Phototherapy
  - Mohs surgery
  - Curettage and cautery
  - Cryotherapy
  - Surgical excision
  - Radiotherapy
  - Follow-up
  - Melanoma
  - Radical lymph node dissection
  - Radiotherapy
  - Excision + radiotherapy
  - Follow-up
Results – NHS cost

• Top-down
  – NHS total cost: £112.4 million
  – Mean cost per melanoma case: £2,560
  – Mean cost per non-melanoma case: £1,226

• Bottom-up
  – NHS total cost: £106.4 million
  – Mean cost per melanoma case: £2,607
  – Mean cost per non-melanoma case: £889

• Programme Budgeting Data 07/08: £104.0 million
• Programme Budgeting Data 08/09: £105.2 million
## Results – Non-NHS cost

<table>
<thead>
<tr>
<th></th>
<th>Malignant melanoma of skin</th>
<th>Other malignant neoplasms of skin</th>
<th>All skin cancers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient costs</strong></td>
<td>£000</td>
<td>% total</td>
<td>£000</td>
</tr>
<tr>
<td></td>
<td>3,380</td>
<td>2.1</td>
<td>14,326</td>
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<tr>
<td><strong>Indirect morbidity costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20,489</td>
<td>12.9</td>
<td>-</td>
</tr>
<tr>
<td><strong>Indirect mortality costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>113,278</td>
<td>71.1</td>
<td>4,706</td>
</tr>
<tr>
<td><strong>Non-NHS cost</strong></td>
<td>137,147</td>
<td>86.1</td>
<td>19,032</td>
</tr>
<tr>
<td><strong>NHS costs</strong></td>
<td>22,162</td>
<td>13.9</td>
<td>90,241</td>
</tr>
<tr>
<td><strong>Total cost</strong></td>
<td>159,308</td>
<td>100</td>
<td>109,273</td>
</tr>
</tbody>
</table>
Results – Projections to 2020

The lower set of lines show projected NHS costs and the upper set show projected total costs. In both sets the dashed line assumes increasing lifetime risk of melanoma (scenario A), the solid line assumes stabilisation in lifetime risk of melanoma (scenario B) and the dotted line assumes falling lifetime risk of melanoma (scenario C). Data from Diffey, 2004
What does this add?

- Programme Budgeting Data provides estimates of costs by disease category in England.
- This study:
  - Allows disaggregating NHS costs
  - Includes non-NHS costs
  - Estimates projections to 2020
Concluding remarks

• Comparability among 3 estimates
• Costs of skin cancer are substantial
  • Excess of those associated with multiple sclerosis and migraine, for instance
• Costs are increasing significantly over time
• CoI studies show economic burden of disease, but we need evidence on cost-effectiveness studies to make prioritisation decisions